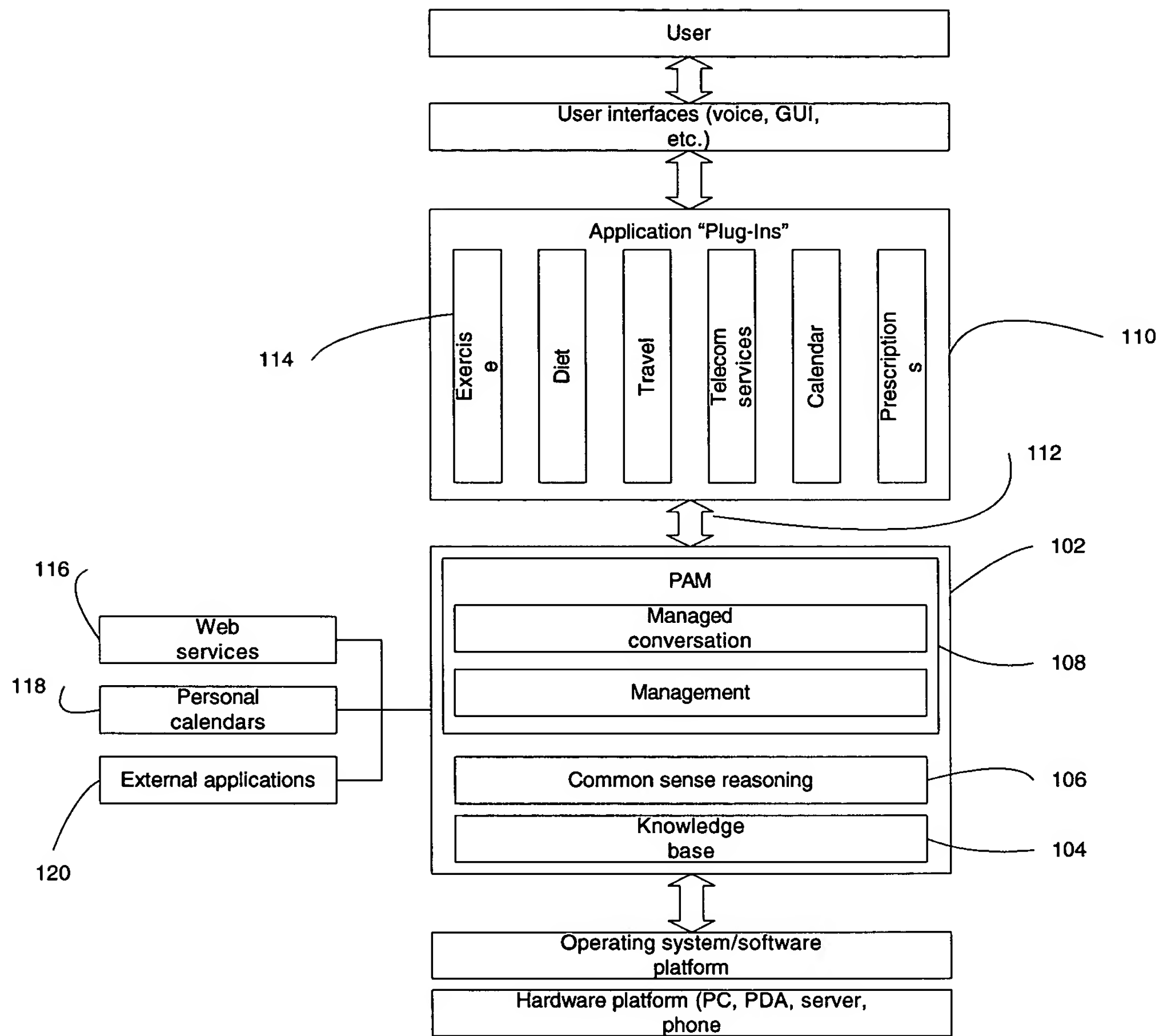
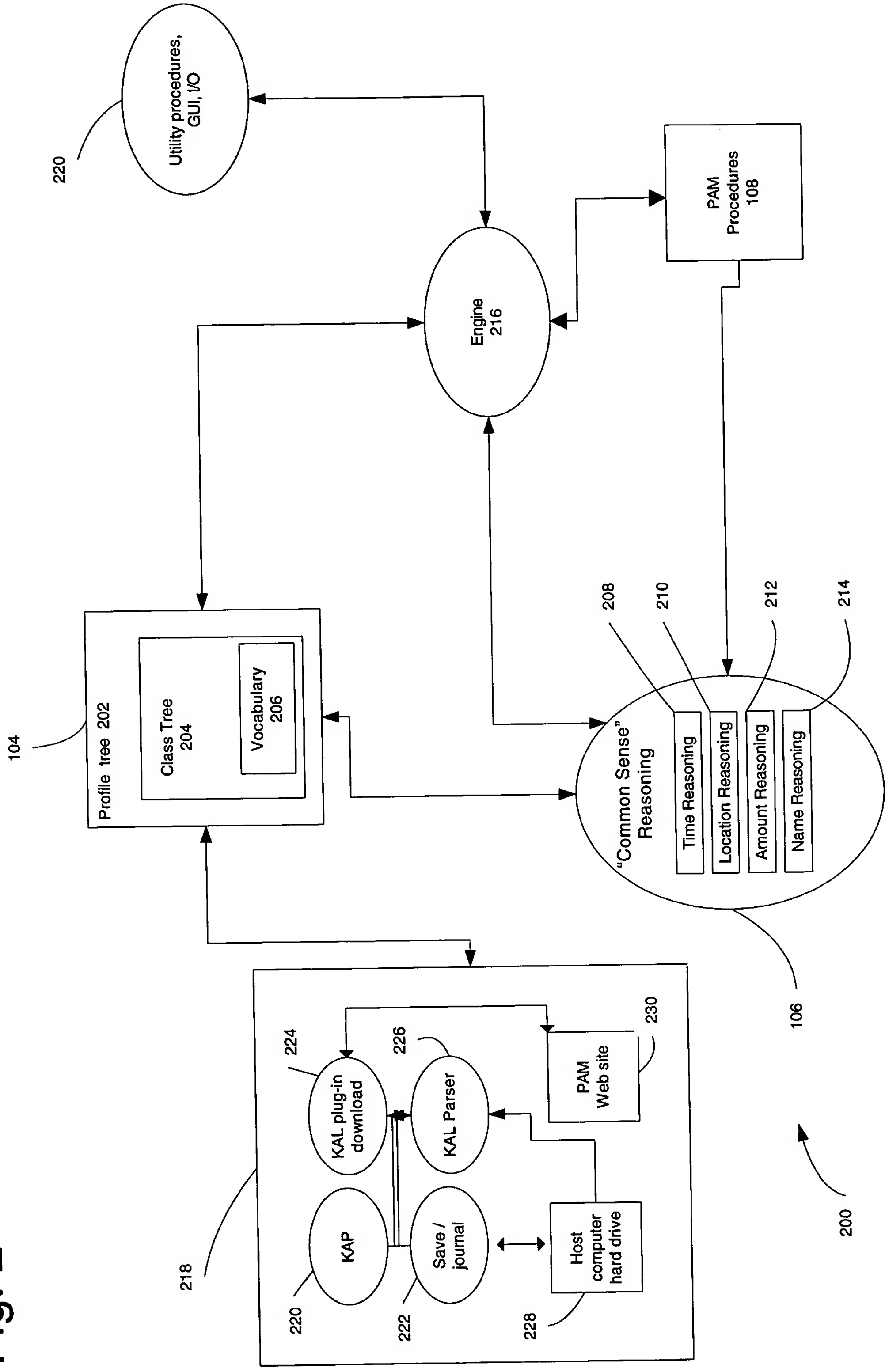


Figure 1



Exemplary architecture 100

Fig. 2



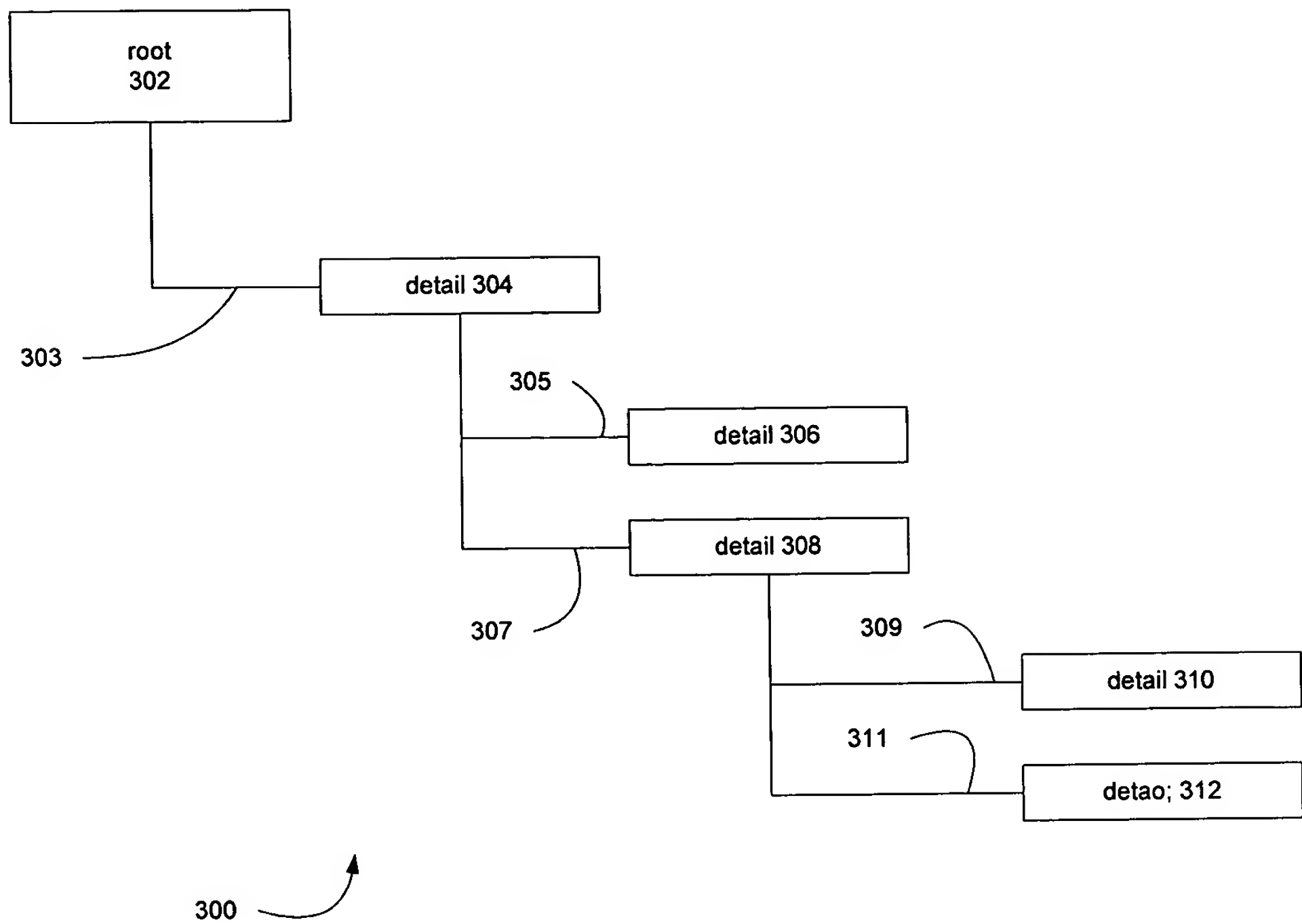
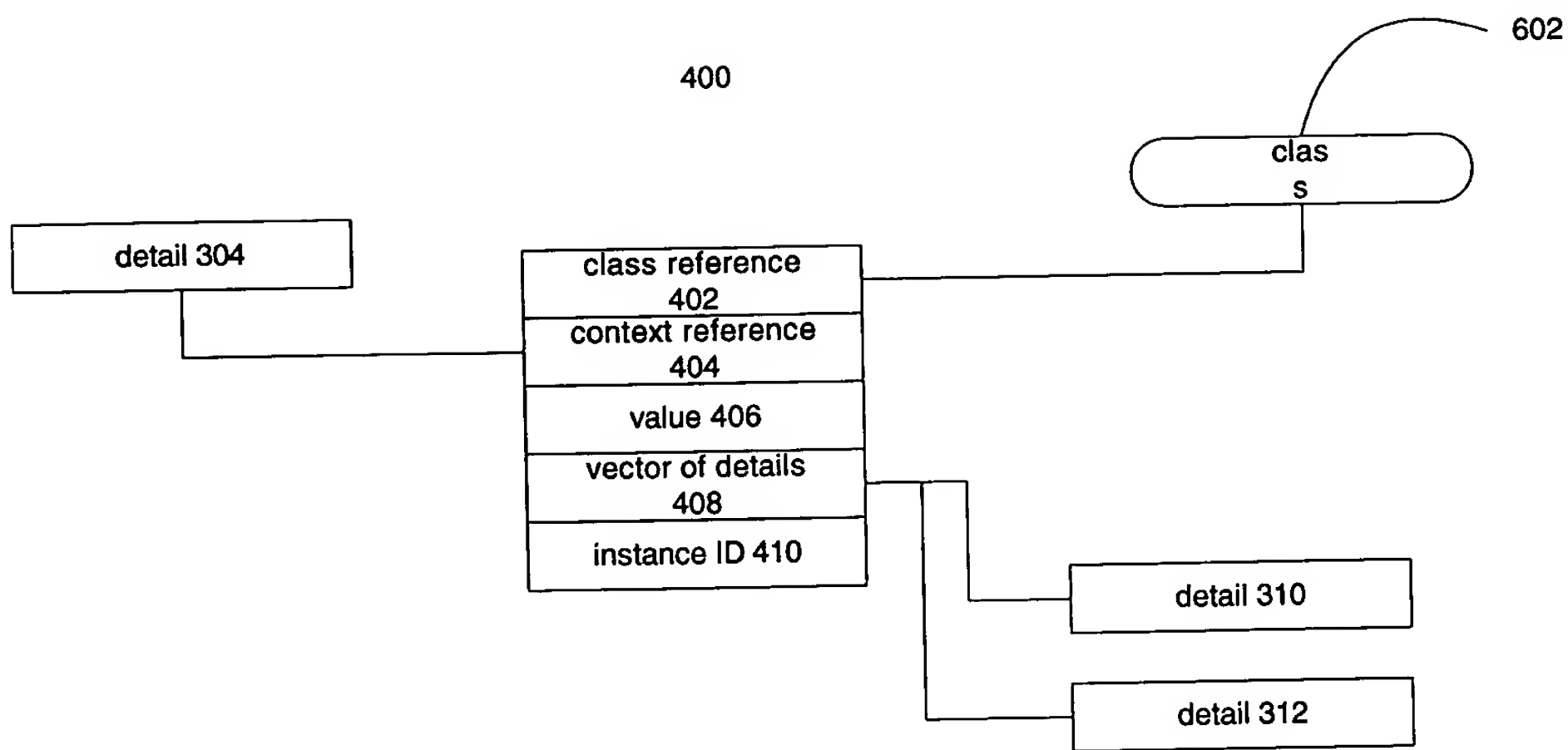


Fig. 3

Figure 4A



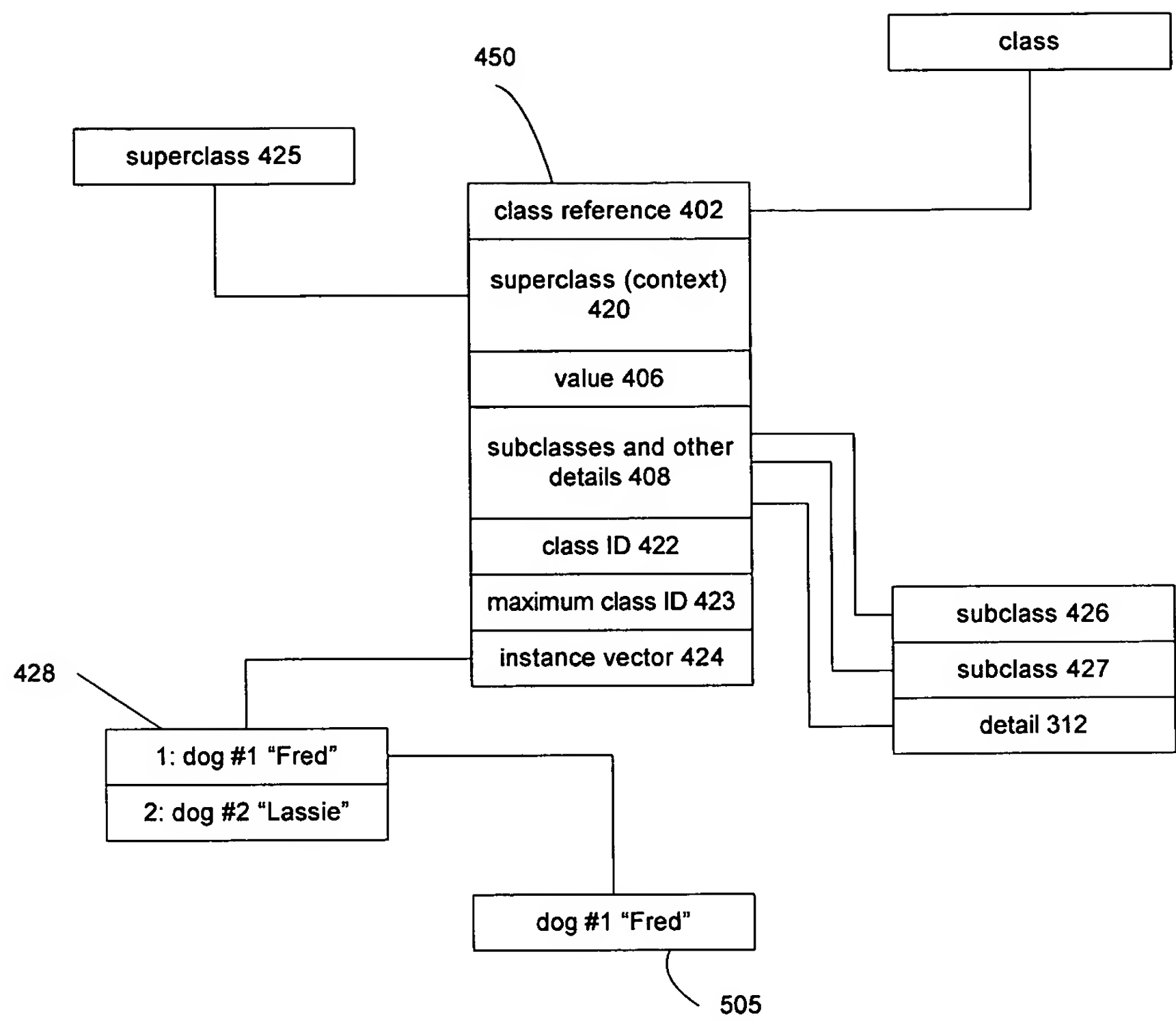


Fig. 4B

Figure 5A

```

    root "PAM profile":
      root "PAM class tree":
602      thing::
604        name::
605        synonym::
          type::
            string::
            number@type::
606      color::
515        qualifier: color
608        black::
609        red::
610      size::
          qualifier: size
612        big::
614      owner::
616      class::
618        word class::
620          primary word class::
622          secondary word class::
624        qualified class::
626          string qualified class::
628          number qualified class::
630          color qualified class::
632          size qualified class::
        living thing::
          animal::
634            mammal::
636            person::
638            canid::
640            dog::
516              synonym: "hound"
642              black dog::
644              big black dog::
645              red dog::
646            domestic animal::
648            pet::
501              inverse relation: owner
502      root "User data":
503        person #1 "Alan Turing":
504          pet: dog #1 "Fred"
505        dog #1 "Fred":
508          owner: person #1 "Alan Turing"
506          color: black
507          size: big
510          class: show dog
```

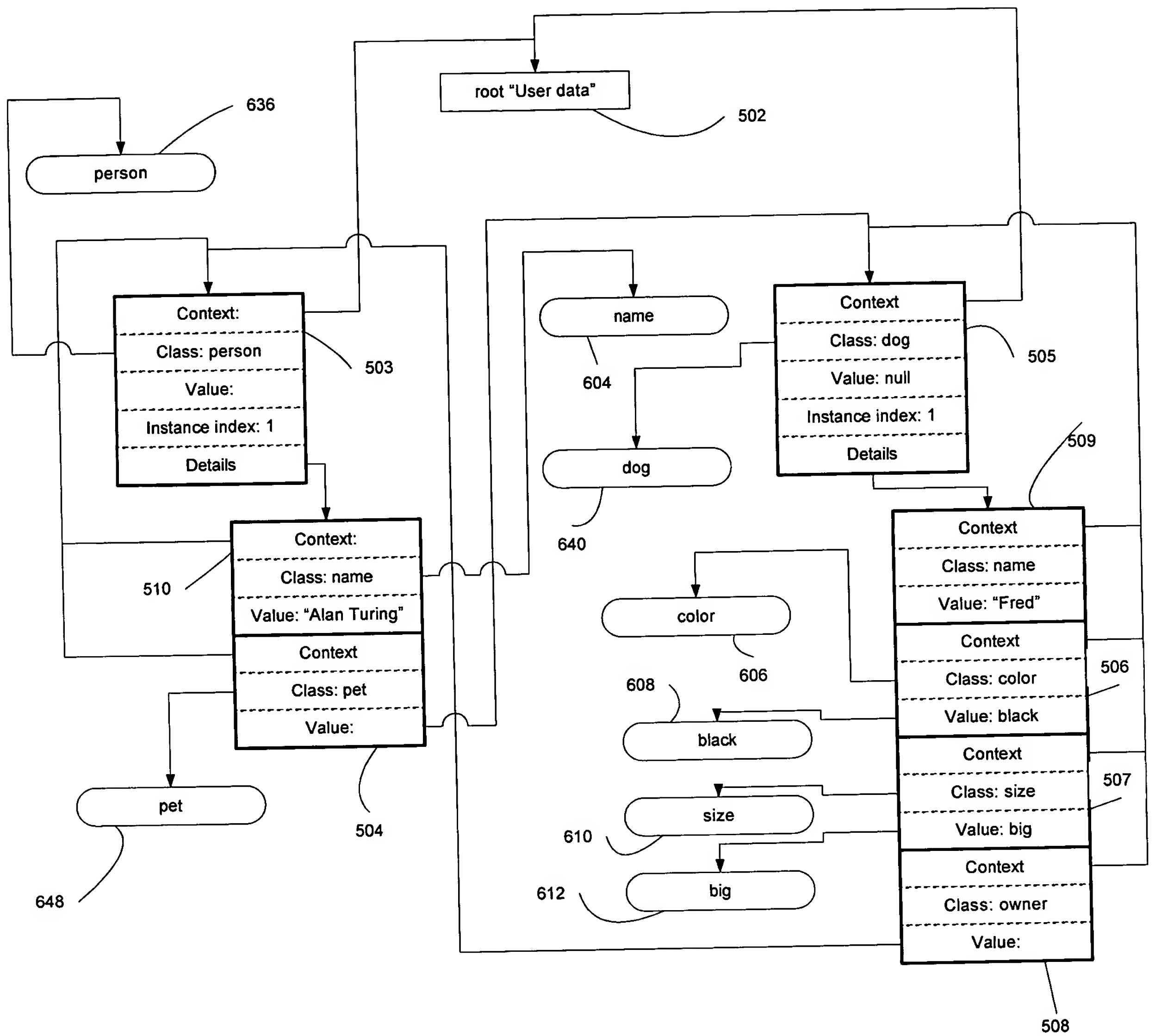


Fig. 5B

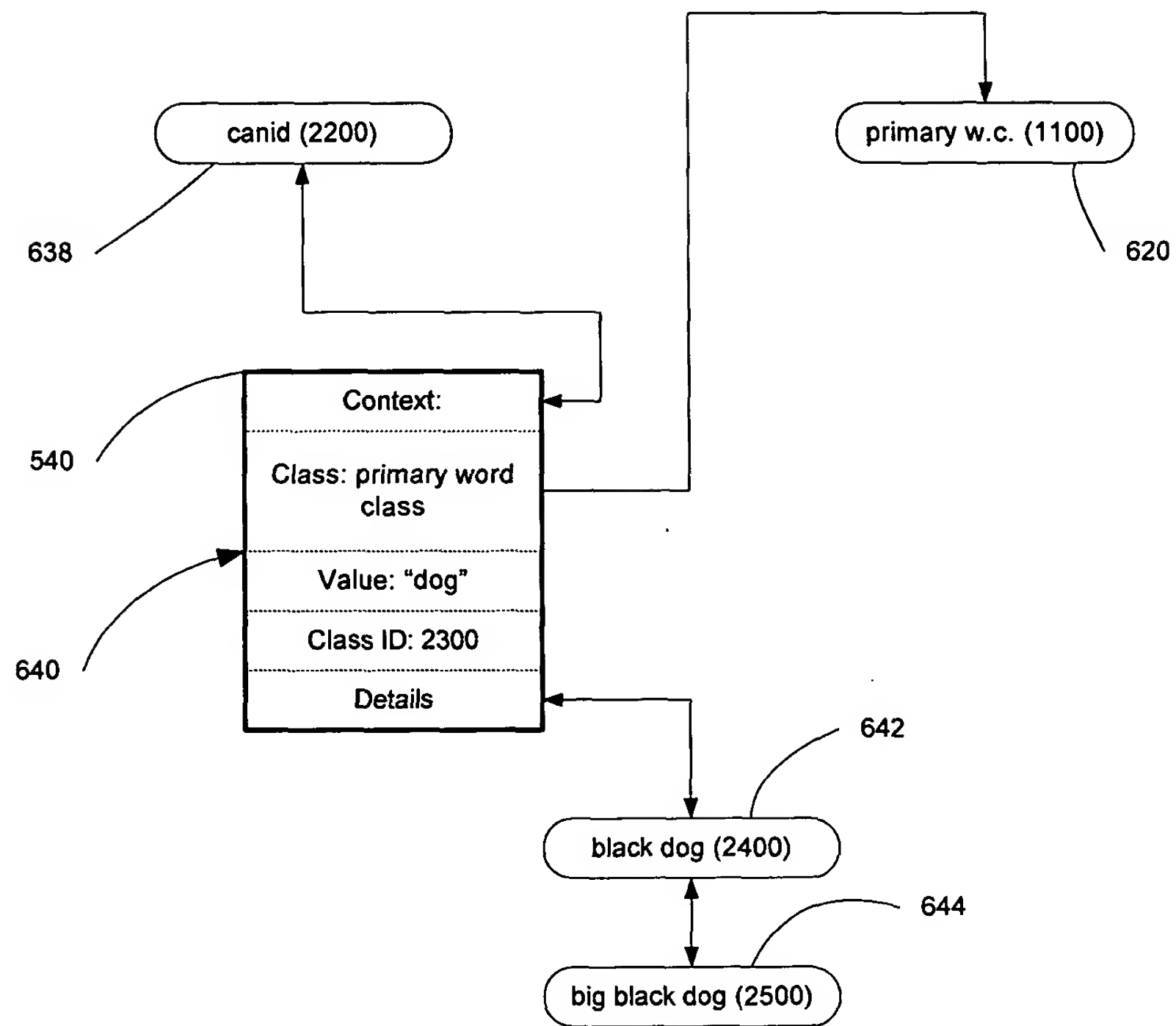


Fig. 5C

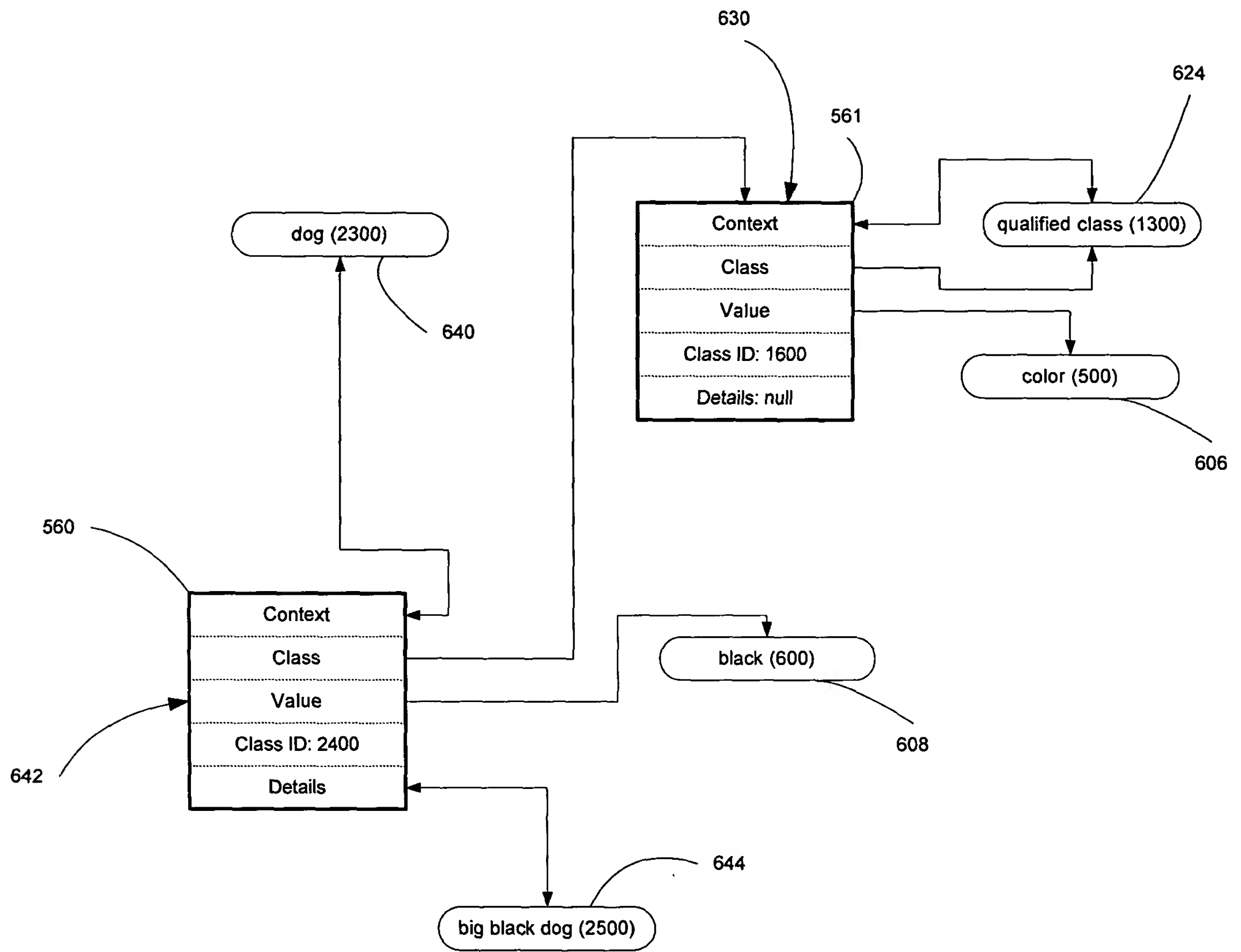


Fig. 5D

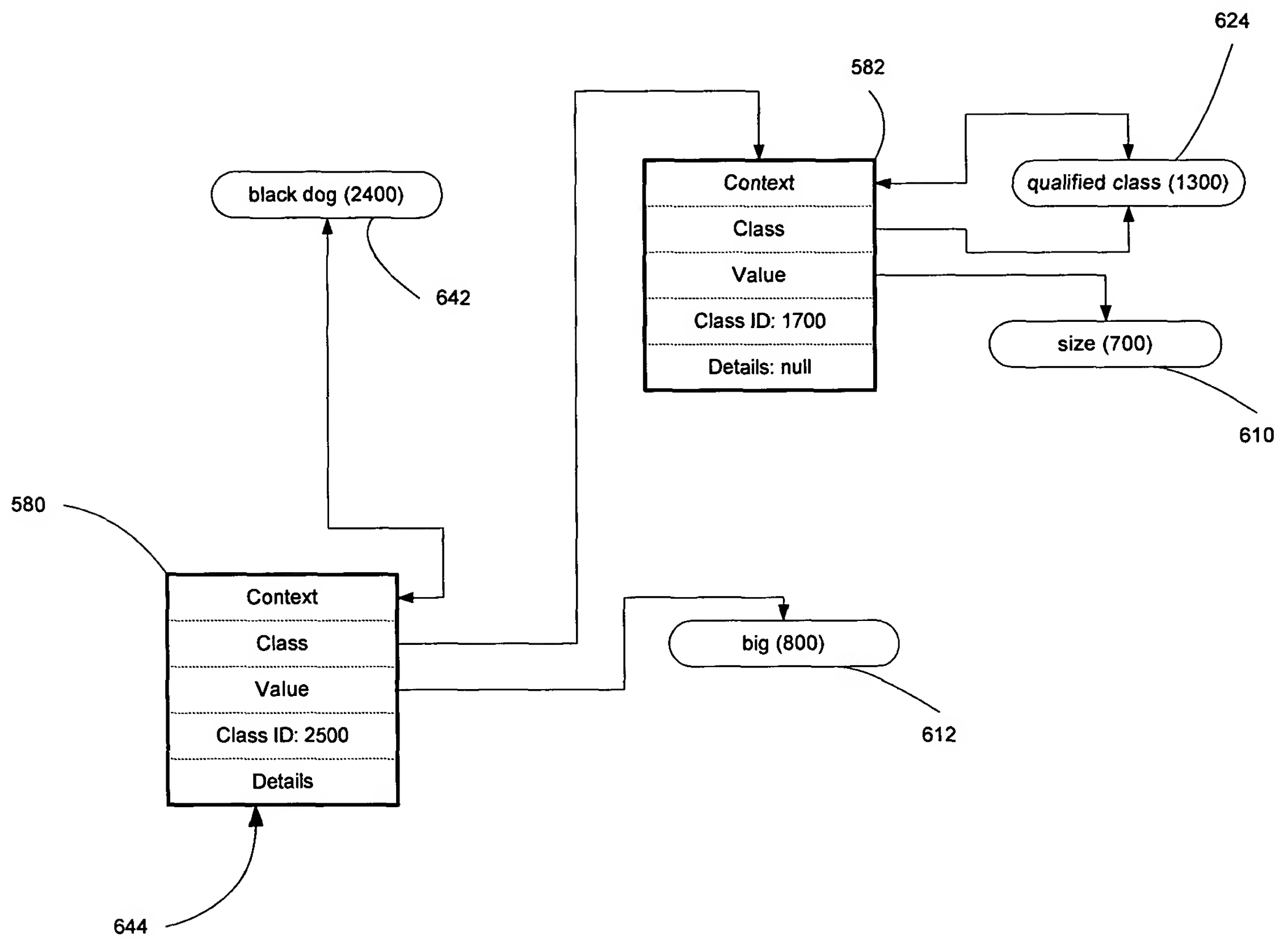


Fig. 5E

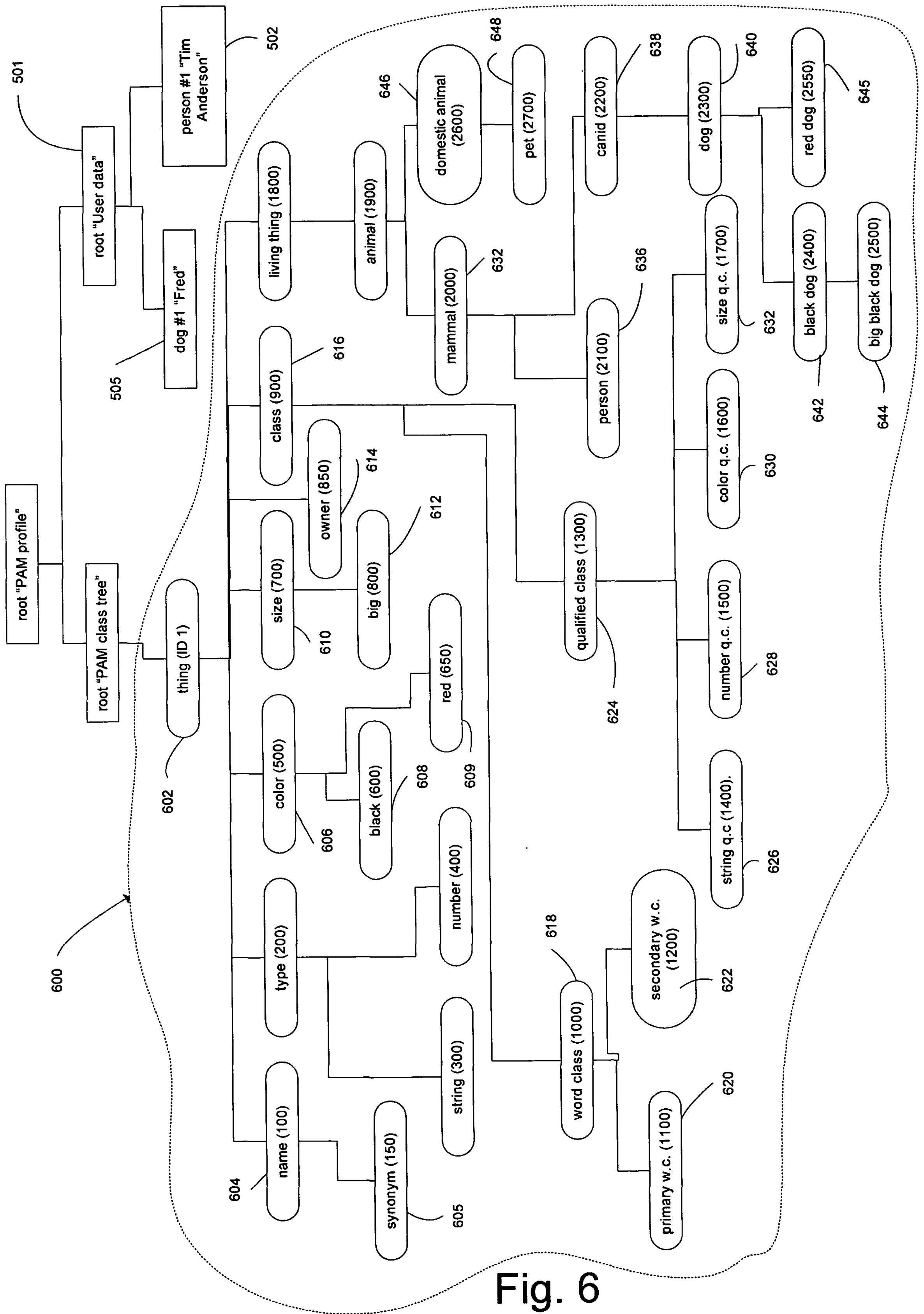


Fig. 6

Figure 7

```
root "PAM profile":
  root "PAM class tree":
    thing::
      organization::
702      employer::
704      inverse relation: employee
      role::
706      employee::
708      inverse relation: employer
      relation::
        inverse relation::
          inverse relation: inverse relation
      person::
710      parent::
712      father::
714      sex: male
716      inherited inverse relation: parent
      mother::
        sex: female
        inherited inverse relation: parent
717      inverse relation: son
        target details:
          sex: male
718      inverse relation: daughter
720      target details:
722      sex: female
724      default inverse relation: child
726      child::
        son::
          sex: male
          inherited inverse relation: child
728      daughter::
730      sex: female
732      inherited inverse relation: child
734      inverse relation: father
736      target details:
738      sex: male
        inverse relation: mother
        target details:
          sex: female
740      default inverse relation: parent
```

Figure 8

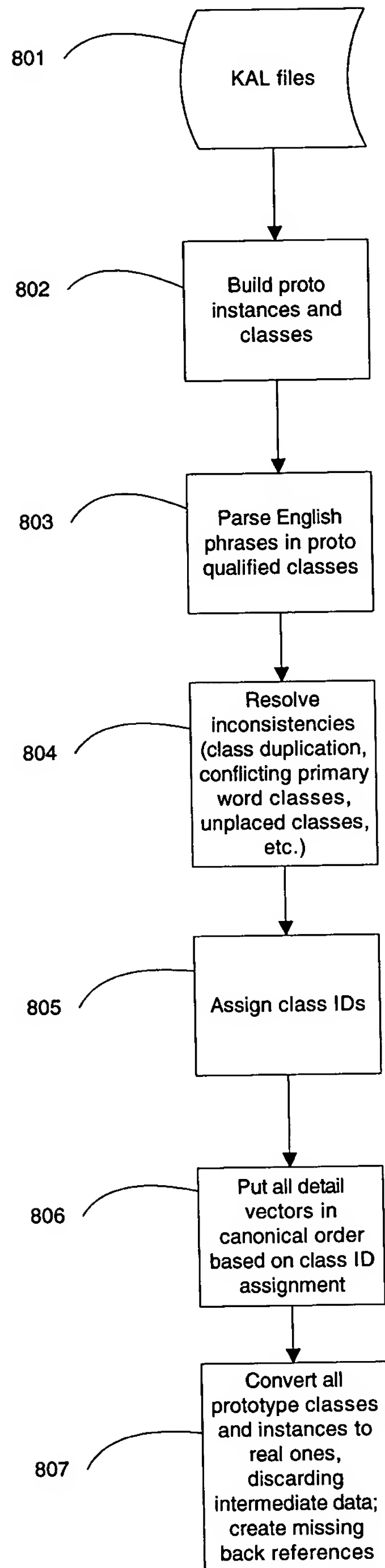


Figure 9

```
root "PAM profile":  
  root "PAM class tree":  
    thing::  
      name::  
      type::  
        string::  
        number@type::  
      color::  
        qualifier: color  
        black::  
      size::  
        qualifier: size  
905      big::  
906      synonym: "large"  
    class::  
      word class::  
        primary word class::  
        secondary word class::  
      qualified class::  
        string qualified class::  
        number qualified class::  
        color qualified class::  
        size qualified class::  
      action::  
901      fly::  
      living thing::  
        animal::  
          insect::  
902          fly::  
          mammal::  
903          canid::  
904          dog::  
907          big black dog::  
908          large black dog::
```

Figure 10

```
root "PAM profile":
  root "PAM class tree":
    thing::
      name::
      type::
        string::
        number@type::
      color::
        qualifier: color
        black::
      size::
        qualifier: size
        big::
      living thing::
        animal::
          mammal::
          person::
          canid::
          dog::
1006          big dog::
1008          typical instance: big dog #1 "typical"
1010          domestic animal::
            pet::
              inverse relation: owner
    root "User data":
      person #1 "Alan Turing":
        pet: dog #1 "Fred"
1002      dog #1 "Fred":
        owner: person #1 "Alan Turing"
        color: black
1004        size:big
1012        big dog #1 "typical":
1014          weight: at least 90 pounds
1016        big dog "Tiny":
```

Figure 11

```

    root "PAM profile":
      root "PAM class tree":
        action::
1101      fly::
        living thing::
          animal::
            insect::
1102      fly@insect::
```


Figure 12

```

    root "PAM profile":
      root "PAM class tree":
        thing::
1202      name::
1204      synonym::
1206      variant::
1208      British variant::
1220      first name::
1222      last name::
1224      synonym: "surname"
1210      building accessory::
1212      elevator::
1213      British variant: "lift"
    ...
    root "User data":
1214      person #1 "Alan Turing":
          pet: dog #1 "Fred"
1216      first name: "Alan"
1218      last name: "Turing"
          dog #1 "Fred":
                owner: person #1 "Tim Anderson"
                color: black
                size:big
```

Figure 13

```

    root "PAM profile":
      root "PAM class tree":
        thing::
          vehicle::
            1302    car::
                    synonym: "automobile"
            1304    typical instance: car #1 "typical"
            1306    instance model:
            1308    important maker detail:
            1310    important model name detail:
            1312    important year detail:
            1314    mileage detail:
            1316    color detail:

    root "User data"
    1318    person #1 "Alan Turing"
    1320    car: car #2
    1324    car #1 "typical":
    1326    number of wheels: 4
    1328    fuel: regular@gasoline
    1330    car #2:
    1332    maker: Honda
    1334    model name: "Civic Hybrid"
    1336    year: 2003
    1338    color: titanium
```

Figure 14

```

root "PAM profile":
  root "PAM class tree":
    thing:: // class ID 1
1402      A:: // class ID 2
1404      A [B:1]:: // class ID 3
1406      C:: // class ID 4
1408      A [C:1]:: // class ID 5
1410      B:: // class ID 6
```

Figure 15

software manufacturer "SoftwareCo":
1502 holiday party #5:
1504 calendar time: 7 pm #43
duration: 5 hours
location: hotel #1 "Charles"
1506 holiday #104 "Christmas Day, 2002":
1508 calendar time: day 25 #68
1509 board@group:
1510 meeting #87:
1512 calendar time: 10.5 am #32
1513 duration: 4.5 hours
location: conference room #1 "board room"
1514 calendar:
1516 year 2002:
1518 October:
1520 day 30:
1522 10.5 am #32:
1524 calendar action: meeting #87
1526 December:
1528 day 6:
1530 7 pm #43:
1532 calendar action: holiday party #5
1534 day 25 #68:
1536 holiday #104:

Figure 16

1602 person “Isabel”:
1604 typical Monday:
1606 8 am:
1608 calendar action: breakfast
1610 9 am:
 calendar action: school
1612 2 pm:
 calendar action: ballet
1614 6.5 pm:
 calendar action: dinner
1616 8.5 pm:
1618 calendar action: bedtime
1620 typical Tuesday:
 8.25 am
 calendar action: breakfast
 7 pm:
 calendar action: dinner
 8.5 pm:
 calendar action: bedtime

Figure 17

```
root "PAM profile":
  root "PAM class tree":
    thing::
      name::
        synonym::
      type::
        string::
        number@type::
1702      instance type::
1704        alternative value: typical, model
1706      management status::
1708        alternative value: not managed, managed
      living thing::
        mammal::
1710          dog::
1712            model instance: dog #2 "model"
1714            dog:
1716              descriptor: typical
      root "User data":
1718        dog #1 "Fred":
          owner: person #1 "Alan Turing"
          color: black
          size:big
1720        descriptor: managed, primary, happy
1722        dog #2 "model":
1724          descriptor: not managed
```

Figure 18A

1802 car::
1804 instance model:
1806 important maker detail:
1808 important model name detail:
1810 important year detail:
1812 management procedure:
1814 step 1: ...
 step 2: ...

1816 prescription::
1818 instance model:
1820 important medication detail:
1822 important dosage detail:
1824 important frequency detail:
1826 important prescriber detail:
1828 important rx number detail:
1830 important fill date detail:
1832 management procedure:
 step 1: ...
 step 2: ...
 step 3: ...

1834 person #39 "Mary Smith":
1836 descriptor: client
1838 car #77:
1840 maker: manufacturer #57 "Honda":
1842 model name: "Civic"
1844 year: 1998
1846 prescription #18:
1848 medication: drug #56 "Lipitor"
1850 dosage: 10 mg
1852 frequency: daily
1854 prescriber: doctor #91 "John Compton"
1856 rx number: 2461357
1858 fill date: 28 October 2002
 expiration date: 28 October 2003

Figure 18B

1834 person #39 "Mary Smith":
1836 descriptor: client
1838 car #77:
maker: manufacturer #57 "Honda":
model name: "Civic"
year: 1998
1860 management #38:
1862 calendar time: hour #597
1846 prescription #18:
medication: drug #56 "Lipitor"
dosage: 10 mg
frequency: daily
prescriber: doctor #91 "John Compton"
rx number: 2461357
fill date: 28 October 2002
expiration date: 28 October 2003
1864 management #44:
1866 calendar time: hour #241

Figure 19

1900 prescription #1 "Caffeine":
1902 medication: drug #1 "Caffeine"
1904 dosage: 10 mg
1906 frequency: three times per day
1908 prescriber: doctor #91 "Alfred Peet"
1910 rx number: 12345
1912 fill date: 28 October 2002
1914 number of refills: 4
1916 prescription supply:
1918 amount: 20 pills
1920 number on hand: 10
1922 minimum number on hand: 6
1924 prescription consumption:
1926 amount: 1 pill
1928 duration: two months

1930 manage prescription:
1932 task: manage prescription supply
1934 task: manage prescription consumption

1936 manage prescription consumption::
1938 frequency: frequency of prescription
1940 alternative 1: past end of use
1942 effect: stop managing
1944 alternative 2: reminding user to take pill succeeds
1946 effect: decrease number on hand in supply by amount
1948 alternative 3: asking user for confirmation succeeds
1950 effect: decrease number on hand in supply by number reported // believe user

1952 manage prescription supply:
1954 frequency: whenever number on hand decreases
1956 alternative 1: number on hand is less than minimum number on hand
1958 effect: replenish prescription supply

1960 replenish prescription supply::
1962 alternative 1: number on hand will last past end of use
1964 effect: stop managing
1966 alternative 2: number of refills of prescription is 0
1968 effect: get new prescription
1970 alternative 3: try refilling prescription automatically
1972 effect 1: decrease number of refills of prescription
1974 effect 2: increase number on hand by amount in prescription supply
1976 alternative 4: try reminding user to refill prescription
1978 effect 1: decrease number of refills of prescription
1980 effect 2: increase number on hand by amount in prescription supply

Fig. 20A

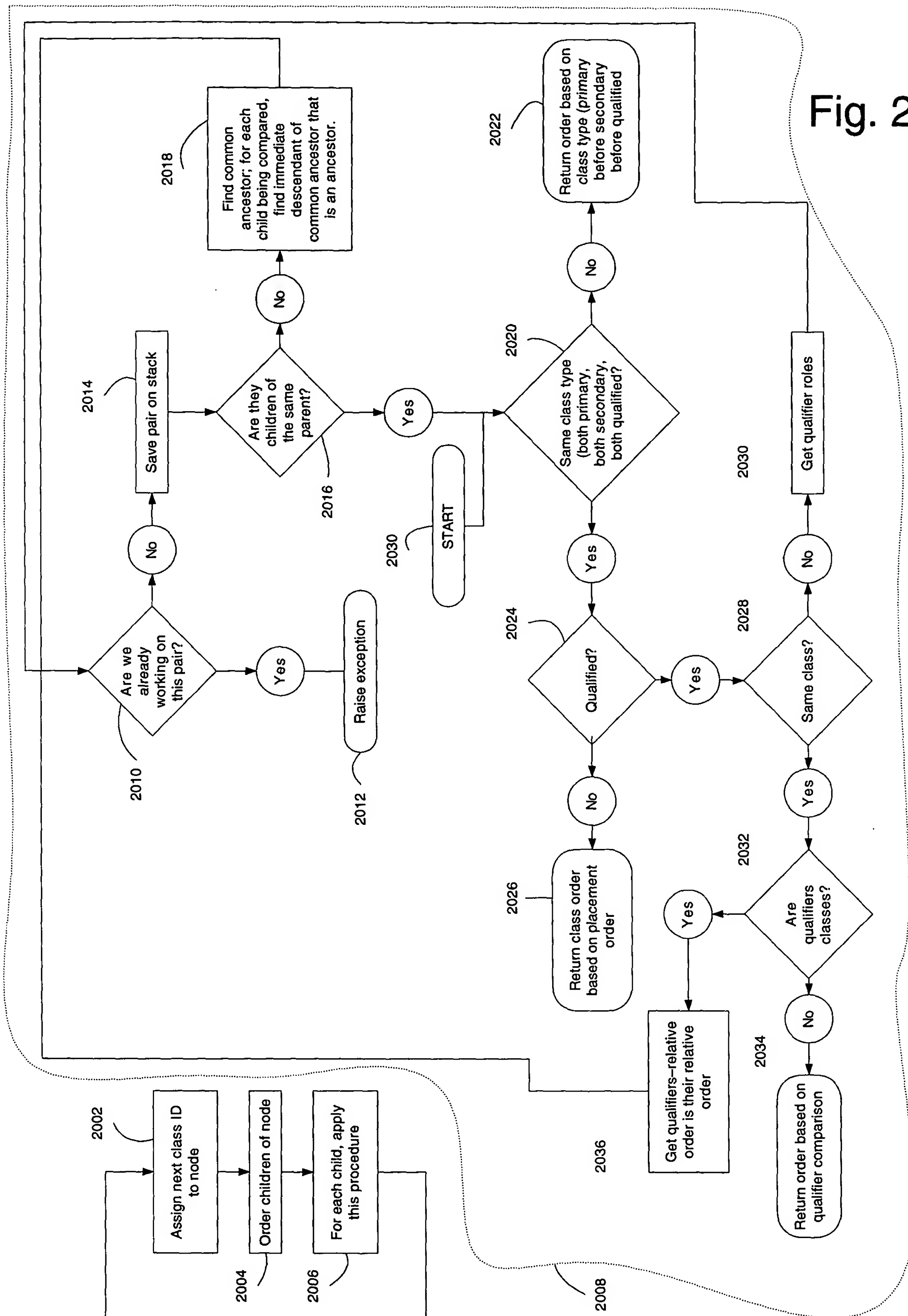


Figure 20B

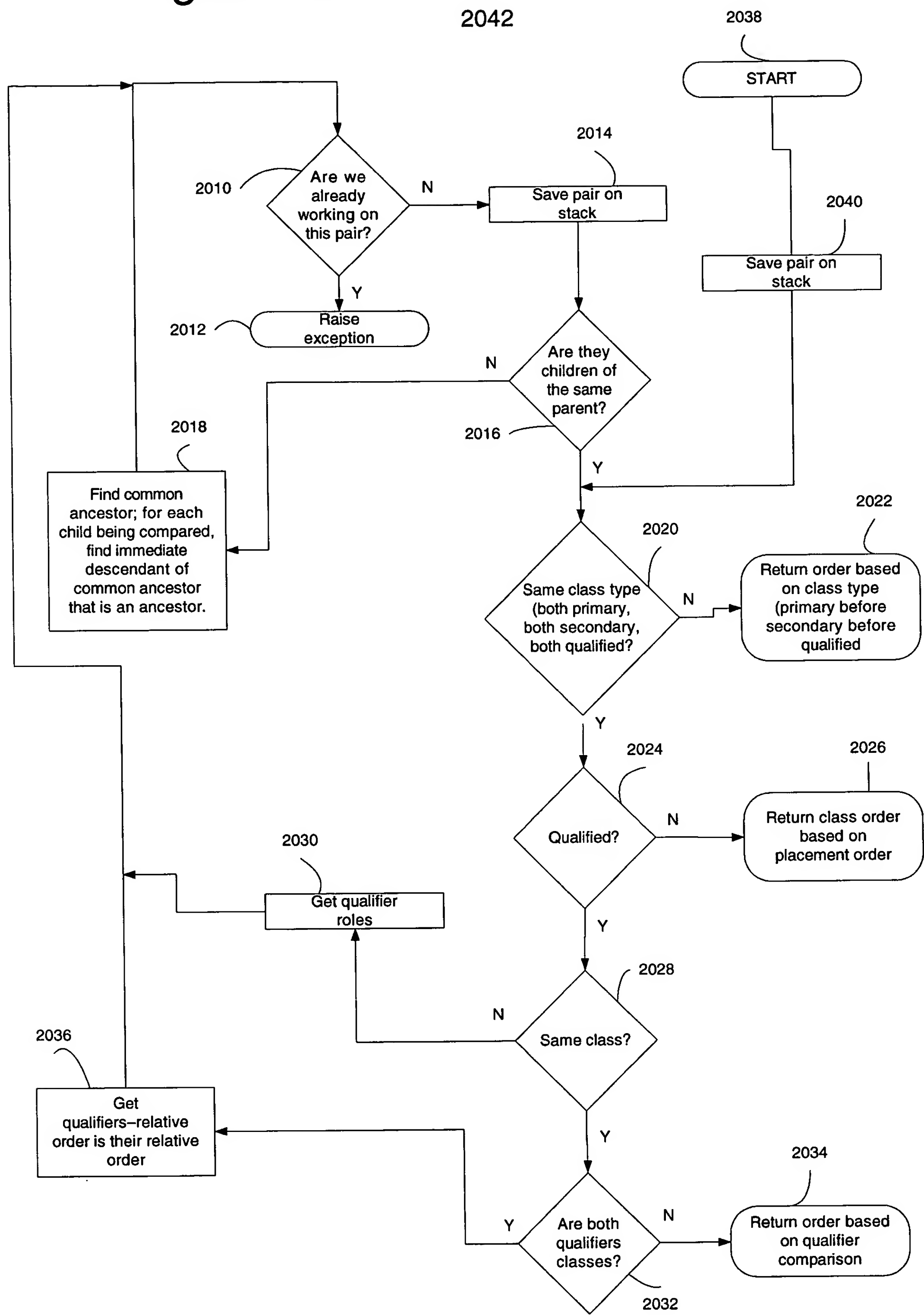


Figure 21

2100	name::
2102	synonym::
2104	word form::
2106	past tense::
2108	plural::
2110	action::
2112	go::
2114	past tense: "went"
2116	bird::
2118	goose::
2120	plural: "geese"
2122	mammal::
2124	dog::
2126	synonym: "hound"

Figure 22

2200	color::
2202	qualifier: color
2204	black::
2206	size::
2208	qualifier: size
2210	big::
	...
2212	primary::
2214	role: importance
2216	secondary::
2218	role: importance